N° 13,368 A.D. 1904

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Complete Specification Left, 1st Mar., 1905—Accepted, 6th Apr., 1905

PROVISIONAL SPECIFICATION.

Improved Apparatus for Softening or otherwise Preparing or Treating Water.

I, WILLIAM MIDDLETON, of 61 Falmouth Road, Newcastle on Tyne, in the County of Northumberland, Electrical Engineer, do hereby declare the nature of this invention to be as follows:

This invention relates to an improved apparatus for softening or otherwise preparing or treating water especially for use in steam boilers, laundries, paper and chemical manufactories and the like, and also adapted to be used for disinfecting and deodorizing the water for flushing water-closets and the like.

The apparatus consists of a hopper, a mixing or flushing tank below the hopper, a storage tank or reservoir at a lower level than the mixing tank and suitable valves and connections.

The hopper is supported on the mixing tank and contains suitable chemicals or other ingredients in the form of powder crystals or liquid. It is preferably of inverted pyramidal or conical form with a circular valve in the bottom. This valve is carried on a horizontal spindle which passes through the sides of the hopper, and is provided with a pocket of suitable capacity for containing a certain quantity of chemicals &c. the said pocket filling when the valve is in one position and emptying when in another position. A vertical pipe opens downwards from the valve chamber. The mixing tank is preferably also of inverted pyramidal or conical form with a short pipe from the bottom opening over or leading into the storage tank. The top of this pipe is closed by a suitable valve. The reservoir or storage tank is of any convenient form and capacity. The water supply pipe is led up by the outside of the storage tank and bent over into the top of the mixing tank. A ball valve on the supply pipe is controlled by a float in the storage tank, so that when the latter is filled, the supply is cut off from the mixing tank. A similar valve is also provided on the supply pipe above the mixing tank, but is controlled by a weight on the valve lever instead of a float. The end of this weighted lever is directly above the valve on the top of the pipe in the bottom of the mixing chamber, and the two are connected by a rod, chain or wire rope. A chain is also connected to the same end of the weighted lever and carried upwards and over a sprocket wheel keyed or otherwise fixed on the spindle of the circular valve in the bottom of the hopper. The chain is then carried over another pulley and has fixed to its other end a close bottomed cylindrical or other shaped balance vessel. The overflow from the mixing tank falls into this vessel and the latter is of sufficient capacity to contain enough water to overcome the weight of the valve weight, the valve in bottom of the mixing tank and the connections. In the bottom of the balance vessel is a small pipe with a cock by which the contents of the vessel can be emptied in a greater or less time as may be required. The action of the apparatus is as follows: The hopper and mixing tank valves are both closed and the supply valve being open, the mixing tank is filled with water. When the tank is full, the water overflows into the balance vessel. The latter when full falls a certain distance and by means of the chain rod &c. opens the valve in the bottom of the mixing tank and permits its contents to escape, closes

overflow vessel is connected by means of a chain with the discharge valve of the mixing tank, with a counterweighted rod controlling the liquid inlet and with the pocket valve by means of a sprocket wheel mounted on the valve spindle.

3. In apparatus of the character described the arrangement wherein the mixing tank is dispensed with and the hopper valve caused to discharge direct into the reservoir, and the overflow vessel is balanced by a weight connected or not to the liquid supply valve.

Dated this 1st day of March 1905.

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MIDDLETON'S COMPLETE SPECIFICATION.

(1 SHEET)

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

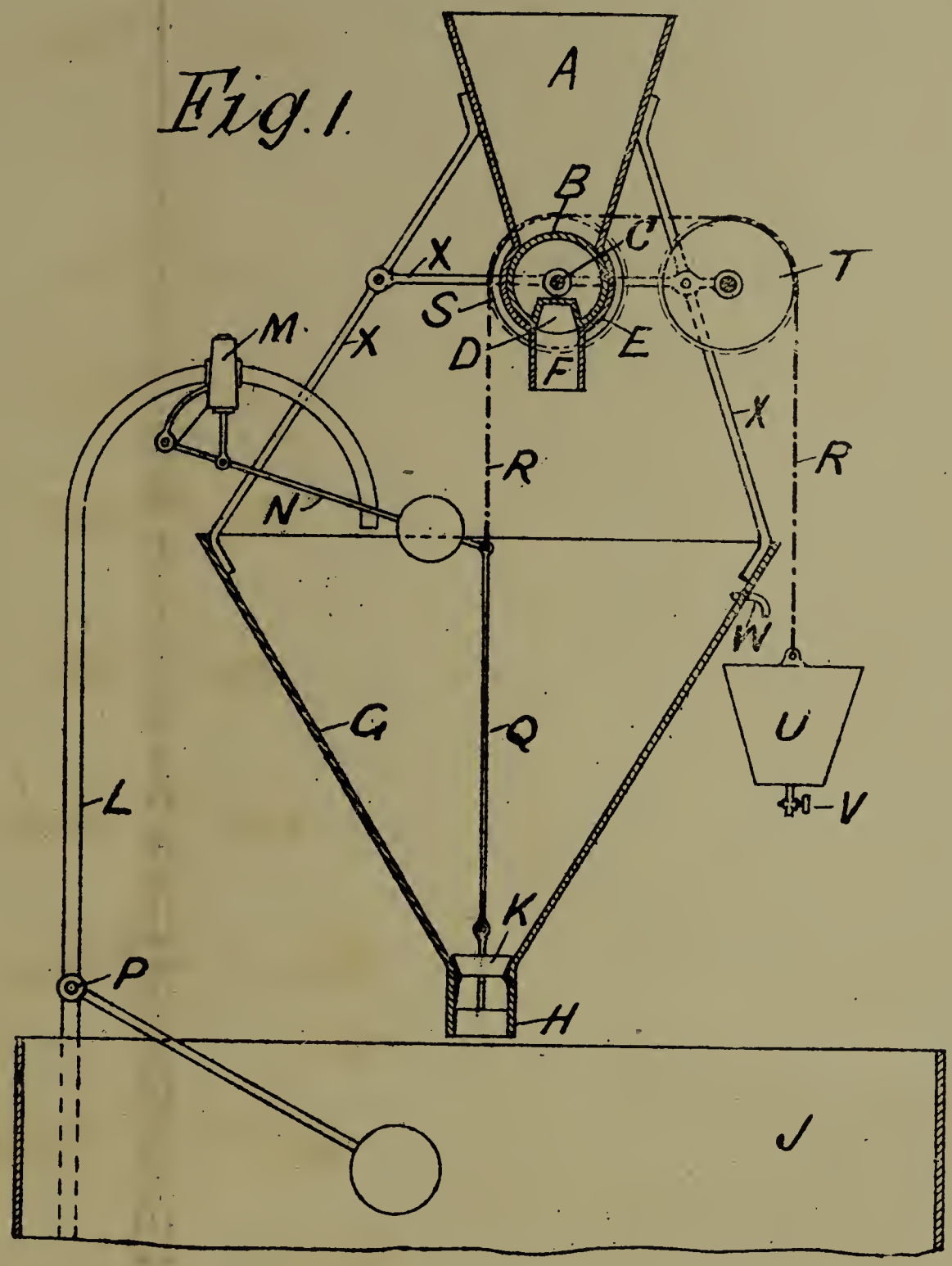


Fig. 2.

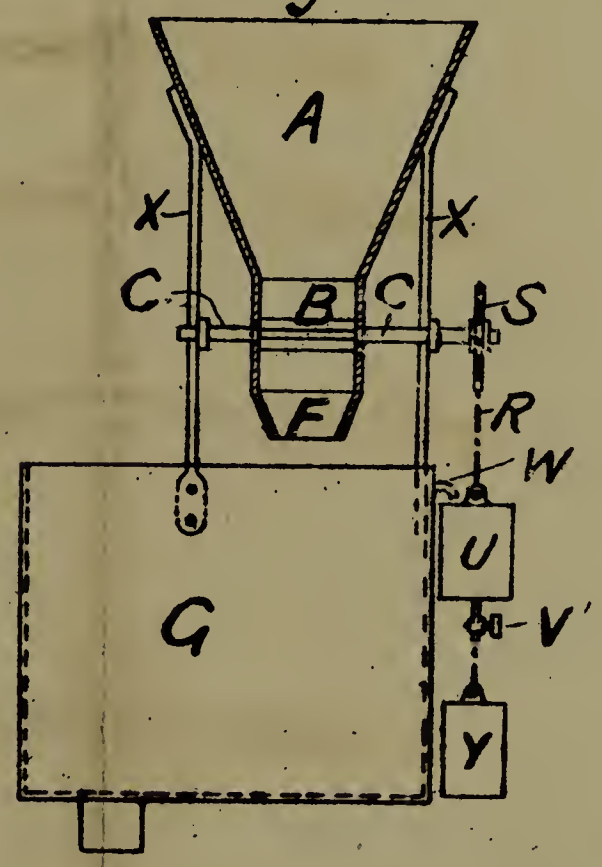
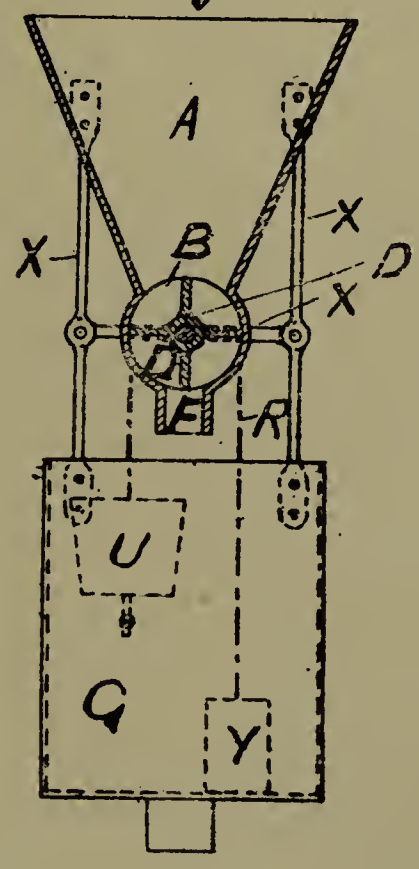


Fig. 3



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